

Research Article

Using Brochures as Educational Tools to Promote Routine HIV Testing in Youth

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Introduction

Human Immune-deficiency Virus (HIV) continues to be a major public health burden in the United States [1]. Despite great progress in treatment and efforts to screen targeted populations, the Centers for Disease Control and Prevention (CDC) reports that about 50,000 people are infected with HIV each year, one in four of these new infections occurs in youth aged 13 to 24 years, and more than half (57.4%) of new infections occur in African Americans [2]. Most of HIV-infected youth (59.5%) are unaware of their infection [2], thus are unlikely to be receiving antiretroviral treatment. This predisposes them to sickness, early death, or unknowingly infecting others.

The CDC [3], the American Academy of Pediatrics [4], and the U.S. Preventive Task Force [5], all recommend making HIV testing a routine part of health care encounter irrespective of patient's reasons for visit and of presence of risk factors. Routine HIV testing is buttressed by strong evidence from trials showing that a consistently suppressed HIV viral load through initiation of antiretroviral therapy is associated with reduced morbidity, mortality and probability of HIV transmission to sex partners [6]. Despite these recommendations, the rate at which adolescents are tested has not changed significantly [7]. Only about 35% of 18-24 year olds tested for HIV, and only 13% of high school students have ever been tested [2]. Accurate and age-appropriate information on risk factors for HIV infection, risk reduction, and access to HIV testing resources are important in making decision about HIV testing [8].

Communication of health messages such as routine HIV testing requires effective dissemination tools. Printed materials have been used to disseminate health messages to patients [9,10], however, their readability, content and appearance have been questioned [11-14]. For example, American Academy of Pediatric Dentistry patient education materials were found to be difficult to read and written

Abstract

About 60% of American youth with HIV are unaware of their infection. Whereas routine HIV testing of youth ages 16-18 is recommended, the level of awareness of the recommendation is low. The purpose of this study was to develop evidence-based brochures that can be used to promote routine HIV testing of youth and to evaluate their effectiveness and acceptability. Brochure development was undertaken in five steps. Twenty-six youth and 30 adults completed a survey on perception of effectiveness and acceptability of the brochures. Adults were more likely than youth to report a change in belief on the need of HIV testing (OR = 5.3, 95% CI: 2.9, 9.7) and perceive brochures as containing enough information to decide to get tested (OR = 2.7, 95% CI: 1.2, 6.0). Attention to content, readability, and appearance of messages is key to production of evidence-based brochures.

Keywords: Health information; Dissemination of health information; HIV/AIDS; Printed medium; Risk communication; Sexually transmitted infections

above the recommended level for the general public [15]. In a study evaluating 21 HPV-related educational materials, it was found that readability levels were too high, content lacked clear purpose or "take home" messages, graphics were out of place, and unexplained medical terminology were included [16]. To date, we are not aware of any systematic investigation on the impact of brochures as an educational tool for disseminating health messages. The purpose of this study was to develop evidence-based brochures for dissemination of information about routine HIV testing of youth and to evaluate their effectiveness and acceptability in fulfilling this function.

Methods

Study setting

The first author is engaged in the evaluation of all Florida/Caribbean AIDS Education Training Center programs. Thus, data for this study were collected as part of a larger HIV testing initiative special project whose goal was to design, produce, and pilot promotional and educational materials to assist youth, parents, and providers in implementing routine HIV testing in medical settings. The current data are based on educational brochures distributed between January and April 2013 by outreach and clinical staff and providers to youth aged 13-24 years and adults (parents/guardians) who accompanied them at two clinical settings and two community events. The first site, Ybor Youth Clinic, provides care to underserved and at-risk youth ages 13-24 years including Lesbian, Gay, Bisexual, Transgender youth (LGBT); homeless and street youth; and sexually exploited youth. The second site, Children's Medical Services, located within a public university, is a clinic for children with specialty medical conditions. The first community event, the *Black History Festival*, took place in the Sweet Bay parking lot in Tampa, Florida. This event targeted African American families and drew a crowd of about 100 people. It included free food, health screenings, children's activities, and live entertainment. The second event, *It's a Family Affair*, took place in a

public parking lot in Tampa, Florida. It attracted about 250 people, mostly minority families. After reading the brochures, participants completed a 1-page paper-pencil survey assessing the effectiveness and acceptability of the brochure.

Brochure development

Two sets of tri-fold brochures were developed using *Adobe Photoshop* software, to target youth and adults. Both sets were designed to be similar in various aspects including content, readability and appearance. The development of brochures was undertaken in five steps outlined next.

Definition of purpose

For both sets of brochures, the objective was to disseminate information about routine HIV testing of youth and to call participants to take action. To communicate this purpose, the front face was titled, "Making HIV Testing Routine." The phrases, "Stop the Spread of HIV" and "Get Tested Today" in youth brochure and "Learn why it is important for your adolescent to get tested for HIV," "Make it part of his/her regular medical checkup," and "Empower your teen" in the adult brochure were intended to call participants to take action: youth to decide to be tested for HIV and adults to encourage youth to be tested.

Content topic identification

Table 1: Participant demographics.

Characteristic	Youth (n=26) %	Adult (n=30) %
<i>Gender</i>		
Female	73	87
Male	27	13
<i>Ethnicity</i>		
Hispanic	23	13
Non-Hispanic	73	80
No response	4	7
<i>Race</i>		
American Indian/Alaskan Native	4	10
Asian	8	0
Black/African American	65	63
Native Hawaiian/Pacific Islander	3	0
White	8	10
No response	12	17
<i>Age range</i>		
13 -24 years	96	0
25 -40 years	0	56
≥41 years	0	41
No response	4	3
<i>Youth goes to school</i>		
Yes	81	83
No	12	7
No response	7	10

Based on review and synthesis of literature on HIV testing [2,3,5,7,17-23], existing guidelines and policies [3-5], frequently asked questions [24], existing materials on HIV testing [1,25], and professional experience of our research team, nine topics were identified: (1) Teens & HIV – The Facts, statistics on HIV infection among youth; (2) What is HIV/AIDS? (3) You can get HIV from\ you cannot get HIV from; (4) Why get an HIV test? [Youth brochure]/ Why encourage your teen to test for HIV? [Adult brochure]; (5) How can I get tested? [Youth] How can my teen be tested for HIV? [Adult] (6); what is HIV tests like? [Youth]/Types of HIV tests [adults]; (7) What if the test comes back positive? (8) Remember, a reiteration of take homes messages; and (9) References.

Message organization

Messages under each content topic were organized based on three criteria for effective printed materials: *content*, *readability*, and *appearance* [16,25]. Regarding content, we ensured that the texts were *thematically simple* (contained a single theme and clear action expected after reading the texts), *brief* (contained unambiguous, non-technical, and consolidated information packages), *accurate* (based on up-to-date and credible information sources including evidence-based clinical practice guidelines), and *organized* (e.g., information is delivered and displayed into easily digestible pieces; most important information is placed at the beginning and repeated at the end; title indicate purpose of text; headers are used to facilitate reading; and contact details are provided). To enhance readability, the degree to which the reader and writer shared meaning of text, we avoided the use of technical words and ensured that ideas within and between sentences cohered. To enhance attractive appearance of brochures, we included a clear purpose (title) in the front face; muted color of paper; ensured there was sufficient white space around each face; left-justified all text; and used readable font size and bullets for cueing. We also ensured the graphics contained enough detail, were culturally appropriate, and portrayed the life world of target audience.

Content validation

A panel of experts (3 clinicians; 2 social workers; 2 faculty members, one with expertise in measurement and another in public health) and sample of intended end-users (4 youth and 3 adults) reviewed the brochures for readability, clarity of language, cultural appropriateness, and usefulness for the intended purpose. The brochures were modified based on triangulated feedback from these reviewers and the panel.

Survey development and administration

Two sets of surveys were developed, for youth and for adults. After reading the brochures, participants completed a 1-page paper-pencil survey designed to assess the effectiveness and acceptability of the brochure in disseminating information about routine HIV testing of youth. Data were collected on participant demographics; youth's sexual orientation; awareness of youth's HIV status; participants' perception of the impact of brochures on knowledge and attitude about routine HIV testing; and perception of brochure content, readability, and appearance. It is important to note that both surveys focused on youth and most of the items were similar. A few items were worded slightly differently to suit the respondent. For example, "I now know where to go for routine HIV testing" in youth survey corresponded to "I now know where my youth can go for routine

Table 2: Youth sexual orientation, prior HIV testing, and awareness of HIV status.

Characteristic	Youth (n=26) %	Adult (n=30) %
Youth's sexual orientation		
Bisexual	0	6
Gay	0	3
Lesbian	4	0
Transgender	4	0
Heterosexual	69	47
Don't know	0	17
No response	23	27
Youth's prior testing for HIV		
Yes	35	36
No	65	64
Awareness of youth's HIV status		
Yes	42	47
No	46	37
Unsure	0	7
No response	12	9

HIV testing” in adult survey.

Because there was no plan to collect identifying information, this study was exempt from the requirement of Institutional Review Board review process. Verbal consent was obtained after the purpose of the study was explained to potential respondents. No monetary incentives were given for participation. A typical encounter involved a clinical provider or community outreach staff approaching a potential participant, screening them for eligibility (youth aged 13-24; parent/guardian of youth), describing the purpose of the brochure, handing a brochure to read, and asking for voluntary feedback through the completion of the survey. All participants read through the brochure and completed the survey before meeting with their physician (for those in clinics) or before the end of the community event.

Analysis

Descriptive analyses (frequencies) were conducted to compare demographics and responses to the questions about youth sexual orientation, prior testing for HIV, and awareness of HIV status for two groups (youth and adults). Effect of reading the brochure (9 items) and acceptability of brochure (7 items) were compared using Chi-square tests. Responses to items was based on a 5-point Likert-type scale (1=Disagree Strongly to 5=Agree Strongly), with affirmative responses (“Agree” + “Agree Strongly”) being used to index the odds of agreement with the statement among youth compared to adults. All analyses were conducted using SAS version 9.2 (SAS Institute, Inc., Cary, NC).

Results

Participant demographics

Fifty-six participants completed the surveys. Youth were predominantly African American female ages 13-24 years. Adults were predominantly African American

women aged over 25 years (Table 1). Ninety percent of the adults indicated that they were youth's biological parents. Whereas over two-thirds of the youth self-identified as heterosexual, less than half of the adults reported that their youth were heterosexual. No youth considered themselves bisexual or gay but a few adults reported that their youth was bisexual (6%) or gay (3%). About a quarter of the participants did not respond to the question about youth's sexual orientation.

When asked about prior testing, slightly over a third of the youth reported having had an HIV test before. Similarly, about a third of adults indicated that their youth had had prior HIV test. Almost half of the youth reported that they were unaware of their HIV status, a result which was consistent in the adult survey in which slightly over one-third of adults indicated that they were unaware of their youth's HIV status (Table 2).

Brochures

Figure 1 presents the youth brochure. It has six faces, three on the front side (columns numbered 3, 2, and 1) and three on the back side (columns numbered 4, 5, and 6). Face 1 contains the *title*, “Making HIV Testing Routine,” superimposed with red ribbon in support of HIV testing; a *call to action* message, “Stop the spread of HIV- Get tested today!” and a *graphic*, a picture of youth happily playing. The picture is colored black to de-emphasize race/ethnicity and instead focus reader's attention on HIV which if not prevented would hinder the happiness exemplified in the picture. The words “HIV” and “STOP” are colored red signifying danger and uppercased to make them stand out. When the brochure is tri-folded, face 2 becomes the last page, the appropriate spot for *references*, and the source of information. In face 3, the reader is reminded about major *take-home messages*, summary of topics presented and a *call to action* message, “Talk to your doctor today” is reiterated. Due to lack of space at the top, faces 4, 5, and 6 are numbered at the bottom. Face 4 presents' important *statistics* on HIV in youths, non-technical definition of HIV, and how HIV spreads. Face 5 includes importance of HIV testing, how and where to get tested, and a reiteration of the call to action message. Youth are encouraged to text their zip codes to locate nearest HIV testing center. Those aged 13 years and older are informed that they can consent to their own HIV testing and treatment without parental permission. Finally, face 6 presents what HIV tests are like and how to handle positive results. Different color shades that are appealing to the youth are used. Though not discussed here, the design of adult brochure followed similar steps as the youth brochure (figure 1).

Effectiveness of brochures

To determine effectiveness of brochures in disseminating health information, we focused on participants' perceived change in knowledge (5 items) and change in attitude or beliefs (4 items) following their experience with the brochures. Affirmative responses (“Agree” + “Agree Strongly”) are presented in Table 3. With respect to *change in knowledge*, most participants affirmed that as a result of reading the brochures, they knew more about how HIV is spread, how to reduce risk of HIV infection, how HIV is tested, where youth can go for routine HIV testing, and the importance of routine HIV testing of youth (Table 3, upper panel). Whereas both groups concurred that their *knowledge* about HIV testing of the youth increased as a result of reading the brochure, adults were more likely to report a *change*

Side 1

3

Remember!

Testing for HIV is important for your personal health and well-being. It is recommended that you get tested at least **once a year**.

There is currently no cure for HIV/AIDS. If detected early, however, HIV is a treatable condition.

The information about sexual health that you share during a doctor's appointment will be kept private. Your information does not have to be given out to anyone, including your parent, guardian, or caregiver.

To be tested for HIV, all you have to do is ask your doctor. **JUST ASK!**

Know your HIV status. You are responsible for your health!

TALK TO YOUR DOCTOR TODAY!

references

Beckett, M.K., Elliott, M.H., Martino, S., Kanouse, D.E., Corona, R., Klein, D.J., & Schuster, M.A. (2010). Timing of parent and child communication about sexuality relative to children's sexual behaviors. *Pediatrics*, 125(1), 34-42. doi: 10.1542/peds.2008-0906

Centers for Disease Control and Prevention. (2011). Youth Risk Behavior Surveillance System: Selected 2011 National Health Risk Behaviors and Health Outcomes by Sex. Retrieved from: http://www.cdc.gov/healthyyouth/yrbss/pdf/us_allsex/yrbss_yrbs.pdf

Centers for Disease Control and Prevention. (2011). Sexual risk behaviors: HIV, STD, & teen pregnancy prevention. Retrieved from: <http://www.cdc.gov/HealthyYouth/sexualbehaviors/>


Committee on Pediatric AIDS. (2011). Adolescents and HIV infection: The pediatrician's role in promoting routine testing. *Pediatrics*, 128(5). doi:10.1542/peds.2011-1781

Syverson, J., Leon, H., Best, J., LaLota, M., Riley, S., & Knox, M.D. (2009). HIV Testing policies in Florida. *Florida Public Health Review*, 6, 45-47.


1


Making HIV Testing Routine

STOP THE SPREAD OF HIV.



GET TESTED TODAY!





Side 2

teens & hiv: the facts

Teens are at risk for becoming HIV positive. Rates of HIV/AIDS among youth between the ages of 13 and 24 has been increasing.

About 90% of teens in the U.S. have never been tested for HIV.

About 50% of teens in the U.S. who have HIV do not know it.

About 50% of high school students report participating in sexual activity.

About 50% of parents have never talked to their sons about using condoms before they participate in sexual activity.

About 40% of teens did not use a condom the last time they had sex.

The Centers for Disease Control(CDC) and the Prevention and American Academy of Pediatrics recommend yearly HIV testing for all people ages 13 and older.

hiv/aids testing for teens: it's routine!

why get an hiv test?

Knowing your HIV status helps you make better choices about your health.

It gives you an opportunity to talk with your doctor about uncomfortable, but important health issues. Your doctor can provide you with information that will help reduce your risk of contracting HIV or Sexually Transmitted Infection (STI).

Requesting an HIV test is a responsible way to manage your personal health. Only you know your risk behaviors and your need for HIV and STI screening.

Today, if detected early, HIV is not curable, but treatable.

IT'S EASY!

An HIV test can be included in routine blood work.

what are hiv tests like?

HIV testing is generally a quick and easy process. Needles are **not always** needed!

Oval: A special cotton pad is rubbed between the gum and cheek then held for 2 minutes. Results come back in 2-3 weeks.

Rapid Test: This test uses a blood drop from a finger prick or mouth swab to collect a sample. The results are ready in about 20 minutes.

Routine Blood Work: Your doctor can order an HIV test during routine blood work. No separate test is needed!

what is hiv?

Human Immunodeficiency Virus (HIV) is a virus that harms the body's immune system, making it unable to fight off infections. HIV is the virus that causes AIDS. HIV lives in 4 body fluids (blood, semen, vaginal fluids, & breast milk).

You CAN get HIV from:

- Having sex without using condoms
- Sharing needles
- Contact with infected blood

You CANNOT get HIV from:

- Casual contact (like hugging)

how can i get tested?

TALK TO YOUR DOCTOR!

Your doctor can order an HIV test as part of your routine blood work.

You can get an HIV test at a community organization.

TEXT your ZIP code to KNOWIT (666462) to find the location near you

Youth ages 13 and older can consent to their own HIV and STI testing and treatment without parental permission.

what if the test comes back Positive?

Early detection is key to improving the quality of life for a young person diagnosed with HIV.

Your doctor will be able to refer you to a doctor who specializes in HIV treatment. There are medications available to effectively treat HIV. There are also youth-friendly services to support you in managing the disease.

You are not alone. There are health care providers to help you maintain quality in your life. There are youth living with HIV who can provide support.

Figure 1: Youth brochure (The numbering of the brochures is to guide the reader. They are not included in the actual brochure).

Table 3: Effect and acceptability of routine HIV testing brochures.

Effect /Acceptability of Brochure	Youth (n=26)	Adult (n=30)	OR (95% CI)
	%	%	
Effect of reading the brochure			
Increase in knowledge about how HIV is spread	69	80	1.8 (0.9-2.0)
Increase in knowledge about how to reduce risk of HIV infection	69	83	2.2 (1.1-4.3)
Increase in understanding of the importance of routine HIV testing	77	77	1.0 (0.5-1.9)
Increase in knowledge about the different methods of HIV testing	65	70	1.3 (0.7-2.3)
Knowledge of where to go for routine HIV testing	77	70	0.7 (0.4-1.3)
Change in beliefs about HIV testing	35	74	5.3 (2.9-9.7)*
Interest in learning more about routine HIV testing	58	70	1.7 (0.9-3.0)
Intention to share routine HIV testing information with parent/youth	81	80	0.9 (0.5-1.9)
Intention to share routine HIV testing information with others	61	73	1.7 (1.0-3.1)
Acceptability of brochure			
Information in the brochure answered participant's questions	61	83	3.1 (1.6-6.0)
Information in the brochure grabbed participant's attention	69	87	3.0 (1.5-6.2)
Information in the brochure is useful	69	86	2.8 (1.4-5.6)
Information is enough to decide to get tested for HIV	77	90	2.7 (1.2-6.0)*
Language used in the brochure is simple	69	87	3.0 (1.5-6.2)
Overall layout of the brochure is organized	77	86	1.8 (0.9-3.8)
Text in the brochure is easy to read	81	83	1.1 (0.6-2.4)
Note: * = statistically significant; OR = Odds Ratio; CI = Confidence Interval			

in beliefs on the need of HIV testing of the youth (OR = 5.3, 95% CI: 2.9, 9.7). Fewer youth than adults expressed interest in learning more about HIV testing or sharing information from brochures with others (non-family members), however, these difference were not statistically significant.

Acceptability of brochures

The extent to which the brochures were acceptable was assessed by focusing on participants' perception about brochure content (4 items), readability (2 items), and appearance (1 item) (Table 3). With respect to *content*, as a result of reading the brochures, slightly fewer youth compared to adults affirmed that the information in the brochure answered their questions, grabbed their attention, or was useful. Adults were more likely than youth to report that there was enough information in the brochures to decide to get tested (OR = 2.7, 95% CI: 1.2, 6.0). In terms of *readability*, fewer numbers of youth compared to adults perceived language used in the brochure as simple. The vast majority concurred that text in the brochure was easy to read. Regarding *appearance*, both groups concurred that overall layout of the brochure was organized (Table 3).

Discussion

Brochure development process and implications

The development of evidence-based brochures for use in disseminating information about routine HIV testing of youth requires inputs from health professionals and target audience.

Attention to content, readability, and appearance of messages presented is key. Given the relative lack of such educational materials, our study contributes to the body of literature on youths' sex education. For example, by listing relevant websites from which health information can be obtained, the brochures form a reliable source of information on sexual and reproductive health education. The brochure development process described here provides a model for use in developing future printed education materials for other health issues beyond routine HIV testing.

How health risk is communicated, for instance, in terms of precision [27], and the framing of health messages [28], are linked to uptake of the messages in order to make health decisions leading to reduced risk. This study represents a departure from other types of risk communication strategies which employ discourses and practices that mobilize fear and blame in order to force people to undergo 'voluntary' HIV testing. Instead, it addresses *what* constitutes risk (e.g., engaging in unprotected sex), *who* is responsible for risk prevention (primarily the youth, although adults' guidance is important), and *which* risk actions are socially acceptable (e.g., use of condoms).

Youth's sexual orientation and sharing of information about HIV testing

The decision to test for HIV or not test may be influenced by youth's sexual orientation [30]. This study reveals a discordant finding related to youths' sexual orientation whereby no youth self-identify as gay or bisexual yet some parents report that their youth is gay or bisexual. These data may be indicating a lack of youth-parent conversation about sex-related topics. This, we suspect, given that a significant proportion of youths and adults (about a quarter in each case) did not respond to the question about sexual orientation. On the other hand, it may be that the few adults who reported that their youth is gay/bisexual did so based on observations of their youth's gender atypical behavior. Future research should explore strategies that parents can use to effectively engage youth, especially LGBT youth, in conversations about sexual orientation without fear for any repercussions. Whereas youth and adults are willing to share the information about HIV testing with each other, the finding that youth and more so adults are less willing to share the information with non-family members may be pointing to the need for more education to sensitize them of the need for sharing health information for the benefit of larger community.

Youth's awareness of their current HIV status and prior HIV testing

The finding that few youth are aware of their HIV status is consistent with previous study in which 70.5% of adolescents reported never having had an HIV test [30], and another in which only 22% had received HIV testing [31]. The finding that most youth are unaware of their HIV status and few parents are aware of their youth HIV status, added to the finding that majority of youth have not had prior HIV testing, suggest the need for promotion tools to increase awareness of routine HIV testing in youth.

Knowledge, beliefs, and interest in HIV testing

Youth and adults concur that the use of brochures increases their knowledge on how HIV spread, how to reduce risk of HIV infection,

how HIV is tested, and why routine HIV testing is important. However, this increase in knowledge does not seem to change belief about HIV testing among the youth or increase youth's interest in learning more about HIV testing. Consistent with prior research, providing written information on HIV testing improves patient knowledge but may not affect test uptake [32,33]. Thus, as part of the next phase of the larger project upon which this study is based, we are developing tools (web applications) to equip providers with knowledge on how to implement routine HIV testing policy. We expect that combined use of the tool and brochures, will increase HIV testing uptake.

Acceptability of content, readability and appearance of brochures

The finding that the information in the brochure answered participants' questions, grabbed their attention, and was viewed as being useful suggest that contents of the brochures were acceptable. That most participants' perceived language used in the brochure as simple and that the text was easy to read suggest the brochures were readable. Finally, the perception that the overall layout of the brochure is organized suggests acceptability of appearance of brochures. In the next phase of this project, we are considering evaluating content, readability and appearance of the two sets of brochures using established measures such as Simplified Measures of Gobbledygook (SMOG) [34] and Fry method [35,36].

This study is not without limitations typical of cross-sectional studies. For instance, the experiences of youth and adults in an urban setting (e.g., Tampa, Florida) where this study was conducted may not generalize to other youth/adult populations, say, in rural areas. We relied on self-reported information which may be affected by recall bias. Efforts were made to minimize these biases. For example, we ensured survey items were worded to be non-judgmental and we fostered trust with each participant by re-assuring them of confidentiality and anonymity. Few potential respondents (5%) declined to take part in the study, citing time as a barrier.

Conclusion

The use of brochures as educational tools to disseminate information about routine HIV testing is more effective among adults than in youth. Adults are more likely than youth to report a change in beliefs on the need of HIV testing and to report that there is enough information in the brochures to decide to get tested. This is the first systematic presentation of how to develop evidence-based brochures on routine HIV testing of youth and evaluation of effectiveness and acceptability of the brochures based perceptions of youth and parents.

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References

- Prejean J, Song R, Hernandez A, Ziebell R, Green T, Walker F, et al. Estimated HIV incidence in the United States, 2006-2009. *PLoS One*. 2011; 6: e17502.
- Centers for Disease Control and Prevention (CDC). Vital signs: HIV infection, testing, and risk behaviors among youths - United States. *MMWR Morb Mortal Wkly Rep*. 2012; 61: 971-976.
- Branson BM, Handsfield HH, Lampe MA, Janssen RS, Taylor AW, Lyss SB, et al. Revised recommendations for HIV testing of adults, adolescents, and pregnant women in health-care settings. [Practice Guideline]. *MMWR. Recommendations and reports: Morbidity and mortality weekly report. Recommendations and reports / Centers for Disease Control*. 2006; 55: 1-17.
- Flynn PM, Aldrovandi GM, Chadwick EG, Chakraborty R, Cooper ER, Emmanuel PJ, et al. Adolescents and HIV Infection: The Pediatrician's Role in Promoting Routine Testing. *Pediatrics*. 2011; 128: 1023-1029.
- Moyer VA. Screening for HIV: U.S. Preventive Services Task Force Recommendation Statement. *Annals of internal medicine*. 2013; 159: 51-60.
- Cohen MS, Chen YQ, McCauley M, Gamble T, Hosseinipour MC, Kumarasamy N, Hakim JG. Prevention of HIV-1 infection with early antiretroviral therapy. *N Engl J Med*. 2011; 365: 493-505.
- CDC. HIV Testing Trends in the United States, 2000-2011. Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention. 2013a.
- CDC. HIV Testing Among Adolescents: What Schools and Education Agencies Can Do. 2014b.
- Sharpe PA, Brandt HM, McCree DH, Owl-Myers E, Taylor B, Mullins G. Development of culturally tailored educational brochures on HPV and pap tests for American Indian women. *J Transcult Nurs*. 2013; 24: 282-290.
- Vadaparampil ST, Quinn GP, Gjyshi A, Pal T. Development of a brochure for increasing awareness of inherited breast cancer in black women. *Genet Test Mol Biomarkers*. 2011; 15: 59-67.
- Finnie RK, Felder TM, Linder SK, Mullen PD. Beyond reading level: a systematic review of the suitability of cancer education print and Web-based materials. *J Cancer Educ*. 2010; 25: 497-505.
- Friedman DB, Hoffman-Goetz L. A systematic review of readability and comprehension instruments used for print and web-based cancer information. *Health Educ Behav*. 2006; 33: 352-373.
- Rhee RL, Von Feldt JM, Schumacher HR, Merkel PA. Readability and suitability Assessment of Patient Education Materials in Rheumatic Diseases. *Arthritis and Rheumatism*. 2012; 64: S1028-S1028.
- Rhee RL, Von Feldt JM, Schumacher HR, Merkel PA. Readability and suitability assessment of patient education materials in rheumatic diseases. *Arthritis Care Res (Hoboken)*. 2013; 65: 1702-1706.
- Amini H, Casamassimo PS, Lin HL, Hayes JR. Readability of the American Academy of Pediatric Dentistry patient education materials. *Pediatr Dent*. 2007; 29: 431-435.
- Brandt HM, McCree DH, Lindley LL, Sharpe PA, Hutto BE. An evaluation of printed HPV educational materials. *Cancer Control*. 2005; 12 Suppl 2: 103-106.
- American Academy of Pediatrics. Committee on Pediatric AIDS and Committee on Adolescence. Adolescents and human immunodeficiency virus infection: the role of the pediatrician in prevention and intervention. Committee on Pediatric AIDS and Committee on Adolescence. *Pediatrics*. 2001; 107: 188-190.
- Beckett MK, Elliott MN, Martino S, Kanouse DE, Corona R, Klein DJ, et al. Timing of parent and child communication about sexuality relative to children's sexual behaviors. *Pediatrics*. 2010; 125: 34-42.
- DiClemente RJ, Wingood GM, Crosby R, Cobb BK, Harrington K, Davies SL. Parent-adolescent communication and sexual risk behaviors among African American adolescent females. *J Pediatr*. 2001; 139: 407-412.

20. Eaton DK, Kann L, Kinchen S, Ross J, Hawkins J, Harris WA, et al. Youth risk behavior surveillance - United States, 2011. *Morbidity and Mortality Weekly Report*, 61((SS04)). 2012; 61: 1-162.
21. Hall HI, Holtgrave DR, Mautsby C. HIV transmission rates from persons living with HIV who are aware and unaware of their infection. *AIDS*. 2012; 26: 893-896.
22. Henry-Reid LM, O'Connor KG, Klein JD, Cooper E, Flynn P, Futterman DC. Current pediatrician practices in identifying high-risk behaviors of adolescents. *Pediatrics*. 2010; 125: e741-747.
23. Marks G, Crepaz N, Senterfitt JW, Janssen RS. Meta-analysis of high-risk sexual behavior in persons aware and unaware they are infected with HIV in the United States: implications for HIV prevention programs. *J Acquir Immune Defic Syndr*. 2005; 39: 446-453.
24. CDC. National HIV and STD Testing Resources; FAQs. 2013b.
25. CDC. Campaign Materials and Events: Look Out for yourself and get an HIV Test. 2014a.
26. Schriver KA. Evaluating Text Quality: The Continuum from Text-Focused to Reader-Focused Methods. *IEEE Transact Professional Communication*. 1989; 32: 238-255.
27. Roche JP, Muskavitch MAT. Limited precision in print media communication of West Nile virus risks. *Science Communication*. 2003; 24: 353-365.
28. Sandell T, Sebar B, Harris N. Framing risk: communication messages in the Australian and Swedish print media surrounding the 2009 H1N1 pandemic. *Scand J Public Health*. 2013; 41: 860-865.
29. Siegel K, Lekas HM, Olson K, VanDevanter N. Gender, sexual orientation, and adolescent HIV testing: a qualitative analysis. *J Assoc Nurses AIDS Care*. 2010; 21: 314-326.
30. Peralta L, Deeds BG, Hipszer S, Ghalib K. Barriers and facilitators to adolescent HIV testing. *AIDS Patient Care STDS*. 2007; 21: 400-408.
31. Samet JH, Winter MR, Grant L, Hingson R. Factors associated with HIV testing among sexually active adolescents: a Massachusetts survey. *Pediatrics*. 1997; 100: 371-377.
32. Duffy TA, Wolfe CD, Varden C, Kennedy J, Chrystie IL. Women's knowledge and attitudes, and the acceptability of voluntary antenatal HIV testing. *Br J Obstet Gynaecol*. 1998; 105: 849-854.
33. Ivens D, Sabin C. Providing written information on HIV testing improves patient knowledge but does not affect test uptake. *Int J STD AIDS*. 2006; 17: 185-188.
34. McLaughlin GH. Smog Grading - New Readability Formula. *Journal of Reading*. 1969; 12: 639-646.
35. Doak CC, LG D, Root JH. Teaching patients with low literacy skills. 2nd edn.